



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

The Seattle-area market for ATIS

Changes in awareness and use of traveler information, 1997-2003

Prepared for:

U.S. Department of Transportation
Federal Highway Administration
Intelligent Transportation Systems Joint Program Office

Washington, DC

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December 2004

Summary

This report provides an overview of the market for traveler information in the Seattle metropolitan area, focusing on three areas: population-wide awareness and use levels, profiles of frequent information users, and enhancement priorities. It is based on the most recent wave of the Puget Sound Transportation Panel survey and is designed to complement earlier work with this data source.

Among the principal findings is the fact that about 50 percent of the region's population was familiar with the major traffic and transit websites in 2003, an increase from 2000 levels. However, other ATIS services continue to have very low awareness levels, even among the population subgroups that comprise their target audiences. The survey also finds evidence of a rise in ATIS usage levels since 2000, with, for example, about 2 percent of the population reporting that they use the Puget Sound Traffic website at least three times in a typical week. However, use of all ATIS services continues to be dwarfed by that of broadcast traffic reports on television and radio.

The profiles of regular traveler information users generated here are quite consistent with earlier findings. Namely, these frequent information users are largely employed commuters with above-average levels of income and advanced technology use, with a greater inclination to plan ahead and express dissatisfaction with their commute. Users of ATIS services that are internet-based are even more distinct along these dimensions.

Enhancement priorities for traffic ATIS have changed little since 1997; large pluralities continue to state that improvements to the timeliness and geographic scope of the information are their top priorities. This sentiment is strongest among frequent users, while less frequent users express relatively more interest in additional content options and formats.

Introduction

Advanced Traveler Information Systems (ATIS) have proliferated in recent years, with deployments of traffic and transit websites, 5-1-1 and other telephone information lines, transit stop displays, and dedicated cable television stations. These services, along with the more conventional traffic reports that are broadcast on radio and television, are defined here as “traveler information.” Traveler information services are designed to give travelers the information they need to make better-informed travel decisions, and to allow transportation networks to operate more efficiently overall.

Understanding the extent to which ATIS deployments are meeting these goals requires a broad-based evaluation effort, encompassing topics ranging from user satisfaction with specific services to analysis of the overall effects of ATIS usage on trip-making decisions and network operations. For public- and private-sector ATIS deployers, one of the most fundamental sets of questions revolves around ATIS users themselves: How many people are using the service? Who are they? What are their priorities for improvements to the service?

Answers to these questions are useful for ATIS deployers seeking to meet their users’ needs and to pursue marketing and outreach strategies. They also serve as important building blocks for other ATIS evaluation efforts, such as estimating ATIS user benefits. This report addresses these questions through an analysis of travel surveys conducted in the Seattle metropolitan area during 2002-2003. Specifically, it provides an update on three key aspects of the consumer market for traveler information:

- Awareness and use levels for major information sources
- Demographic and attitudinal profiles of frequent users
- Users’ priorities for ATIS enhancements

Background on the Research

The research presented here is the result of a partnership between the Puget Sound Regional Council (PSRC) and the Federal Highway Administration’s Joint Program Office for Intelligent Transportation Systems (JPO). The PSRC, in its role as the metropolitan planning organization for Seattle, conducts research on regional travel patterns and transportation needs. The centerpiece of this research is the Puget Sound Transportation Panel (PSTP), a longitudinal survey of household daily travel patterns. The PSTP survey has been administered in ten successive waves, starting in 1989 and repeated every one or two years since then. In each survey wave, a sample of approximately 1,700 households (typically about 3,100 people) is selected, retaining as many households as possible from the previous wave. Households that have left the

panel, for example after moving out of the area, are replaced with similar households so as to maintain a roughly equal sample size from one wave of the survey to the next. The PSTP sample is also designed to be representative of the four-county PSRC area, though it is stratified by commute mode and county of residence, and includes an intentional oversample for transit riders and carpoolers. In each wave, respondents provide demographic information and then complete a 48-hour travel diary, recording all of their trips taken over this period – including details such as the purpose and destination of the trip, the mode of transport used, and departure and arrival times.

The partnership between the PSRC and the JPO has led to several ATIS-related supplements being added to the PSTP surveys. This began with the Wave 7 administration in 1997, in which respondents were asked about their patterns of traveler information usage. For Wave 9 in 2000, these supplemental surveys were expanded to measure respondents' level of awareness of ATIS sources, their personal attitudes toward local travel, use of advanced technologies, and their use of traveler information on specific trips recorded in their travel diaries. For Wave 10 of the PSTP administration in 2003, there was once again a supplemental survey on awareness of information sources and use of technologies. The core survey instrument, the travel diary, was itself also expanded, with supplemental questions added in order to gauge the impact of information acquisition on specific travel choices.

As a result of these data-collection efforts, the successive waves of PSTP surveys now represent one of the only sources of U.S. data that can shed light on all of the following issues:

- Use of ATIS amongst a representative sample of the general population, as opposed to self-identified users of specific services
- Changes in awareness and use over time amongst the general population
- The influence of specific trip characteristics on the decision to consult information
- The impacts of information acquisition on travel behavior in real-world settings.

Prior work with these datasets has been presented in papers focusing on the effects of information use on trip-making decisions¹; ATIS market segments²; the factors affecting the decision to consult information³; and the relationships among technology ownership, ATIS awareness, and ATIS use⁴. This report is designed as a continuation of efforts to track basic market conditions for traveler information services. It describes awareness

¹ Peirce, S. and J. Lappin. 2003. Acquisition of traveler information and its effects on travel choices: evidence from a Seattle-area travel diary survey. Report for Federal Highway Administration, No. 13813.

² Mehndiratta, S. et al. 2000. Who are the likely users of ATIS? Evidence from the Seattle region. Transportation Research Board, 79th Annual Meeting, Washington, DC. Peirce, S. and J. Lappin. 2003. Segmenting the Seattle-area market for ATIS. Report for Federal Highway Administration.

³ Peirce, S. and J. Lappin. 2004. Why don't more people use advanced traveler information? Evidence from the Seattle area. Transportation Research Board, 83rd Annual Meeting, Washington, DC.

⁴ Goulias, K.G., T.-G. Kim, and O. Pribyl. 2004. A longitudinal analysis of awareness and use for advanced traveler information systems. ITS Journal, Volume 8, No. 1, pp. 3-17.

and use levels as of 2003, presents brief profiles of traveler information users, and describes users' priorities for service enhancements. To the extent that similar data are also available from the 2000 wave (and, in some cases, the 1997 wave) of the PSTP survey, the report also describes how these factors have evolved over time.

Findings

Awareness and Use Levels

Awareness levels are near 50 percent for the major websites, but many services are still largely unknown even among their target audiences

Travelers must be aware of an information source before they can use it. This is a very basic point, but analysis of prior survey waves⁵ demonstrated that most Seattle-area residents had never heard of many of the region's ATIS offerings. To assess the extent to which this was true in 2003, our supplemental personal survey again asked PSTP respondents to rate their familiarity with a range of traveler information services on a scale from "I've never heard of it" to "I use it five times per week or more." Figure 1 shows the percentage of respondents who indicated that they were aware of a particular source – i.e., that they had heard of it, even if they had not necessarily used it.

Figure 1. Awareness of traveler information sources, 2003 (percentage of respondents indicating that that they had heard of the source)

Radio traffic reports	97%
TV traffic reports	96%
Washington State ferry website	55%
WSDOT Traffic Telephone	49%
Puget Sound traffic website (WSDOT)	48%
King County Metro Online	45%
Traffic TV cable station	34%
TransitWatch bus status monitors	25%
511 traveler information phone line	15%
Bus View website	13%
MyBus electronic updates	13%

As the table shows, broadcast traffic reports on radio and television have awareness levels close to 100%. Additional analysis revealed that this near-universal awareness cuts across demographic lines, with awareness levels over 90% among respondents of both sexes, all age groups, and at all levels of income, education, and technology usage.

⁵ Peirce, S. and J. Lappin. 2003. Evolving awareness, use, and opinions of Seattle region commuters concerning traveler information: Findings from the Puget Sound Transportation Panel Survey, 1997 and 2000. Transportation Research Board, 82nd Annual Meeting.

In a metropolitan area where almost every TV and radio station carries traffic updates, it is hard *not* to be aware of these broadcast services.

By contrast, awareness of ATIS services in other media remains much more limited. Measured awareness levels have certainly risen since 2000, when the major ATIS websites had awareness levels around 25% and most of the other services were in the single-digits. Part of this rise may however be due to a methodological change in the way the question was asked⁶. In any event, most ATIS services are now either just at, or well below, 50% awareness, meaning that while awareness has risen, many or most Seattle-area residents have not yet heard of these potentially valuable sources of information.

Part of this limited awareness is undoubtedly due to inherent limitations on the reach of some systems. The Traffic TV cable channel, for example, is only available on certain cable systems, and the TransitWatch bus status monitors are installed only at a handful of bus stations. One might also suspect that limited awareness of internet-based services might be due to the fact that many people lack online access or are unfamiliar with the web. However, cross-tabulations of the responses show that not to be the case, with awareness of the WSDOT traffic website only marginally higher (54%, versus 48% overall) among those who use the internet at home⁷.

Even among respondents who are both regular commuters⁸ and users of “broadband” (high-speed) internet access at home, the awareness figure is again only marginally higher, at 61%. And for BusView and MyBus, both of which are internet-based services that provide real-time information on bus arrivals, awareness levels are only 17% and 15% (respectively) among the group of respondents who use the internet from home and regularly take the bus.

Thus, some of the region’s most sophisticated sources of real-time traffic and transit information continue to be unknown to a majority of the region’s public. In many cases they are also largely unknown even among their “target audiences,” i.e. the demographic sub-groups who would be expected to form the core of their user base. This suggests that the return on the public investments in these services will be greater if additional efforts are made to market and promote them. This is especially true when one considers that the incremental cost of serving new users is often very low once the service has been

⁶ For the 2003 administration, the format of the awareness question was changed to require a yes or no answer for each traveler information service, rather than (as in 2000) only a yes answer where applicable. This change has improved the quality of the data by reducing problems with item non-response, but it reduces comparability between 2000 and 2003 on this measure.

⁷ For the internet- and broadband-related measures, a respondent is a “user” if he or she reports using the service once per week or more.

⁸ “Regular commuters” are those who go to a workplace outside the home, or attend school or college, on a regular basis, at least three days in the average week.

deployed, and that those who already use ATIS websites tend to report high levels of satisfaction with the service.⁹

Broadcast traffic reports remain the leading information source

Given the awareness levels described above, it is not surprising that broadcast traffic reports continue to be the most commonly used sources of traveler information. Radio in particular is well-used, in part because drivers can continue to monitor the radio even after departing.

Figure 2. Percentage of respondents using each source 3 times per week or more

	2000	2003
Radio traffic reports	20%	27%
TV traffic reports	19%	14%
Puget Sound traffic website (WSDOT)	1%	2%
Traffic TV	1%	1%
Washington State ferry website	0.4%	1%
King County Metro online	0.3%	1%

As Figure 2 shows, regular users of the WSDOT traffic website continue to constitute a small group, about 2 percent of the general population in 2003 and much smaller than the user bases for radio and TV reports. Other ATIS sources likewise have very small groups of regular weekly users. Of course, it has been noted that ATIS is often used for the exception rather than as a rule – that is, it is a useful tool for planning an unfamiliar trip or an upcoming trip that will be especially time-sensitive. One way of addressing this question is to look at the percentage of respondents who have *ever* used a particular source, which is shown in Figure 3.

⁹ Petrella, M., and Lappin, J. Los Angeles and Seattle: A Comparative Analysis of Customer Response to Online Traffic Information. Presented at the 83rd Annual Meeting of the Transportation Research Board. Washington, D.C. 2004.

Figure 3. Percentage of respondents who have ever used each source, 2003

	Overall	As percentage of those aware of the service
Radio traffic reports	77%	79%
TV traffic reports	61%	64%
Washington State ferry website	24%	44%
Puget Sound traffic website (WSDOT)	21%	43%
King County Metro online	18%	40%
Traffic TV	7%	21%

While Figure 2 shows that regular weekly usage of the high-tech ATIS services is not very widespread, Figure 3 shows that these services do attract a fair amount of occasional usage among those who are aware of them. For the traffic-related services, this may be a function of the tendency of many travelers to seek out information only during severe weather conditions or major traffic disruptions. For the Washington State Ferry and Metro websites, it is likely an indication that people are accessing the websites to plan occasional ferry and transit trips or obtain “static” schedule and fare information, rather than habitually turning to the sites for real-time status updates.

User profiles

Information on the demographic and attitudinal profiles of traveler information users is intended to help public- and private-sector ATIS deployers to understand who their customers are, and how they derive value from the services. Demographic information in particular can help ATIS services better identify and target potential groups of customers within the population, while attitudinal data can help deployers understand people’s motivations for seeking information as well as the type of information that they would find most useful.

We generated two separate profiles: one of traveler information users in general, that is, those who frequently use *any source* of traveler information, as well as a specific profile of frequent *online* ATIS users in particular. As shown above, regular use of online ATIS is still limited to a fairly small subset of the population. Our two profiles thus allow for both a profile of the small group of “early adopters” of new technologies, as well as a profile of the broader set of information users who might be predisposed to use more sophisticated ATIS services as they are developed.

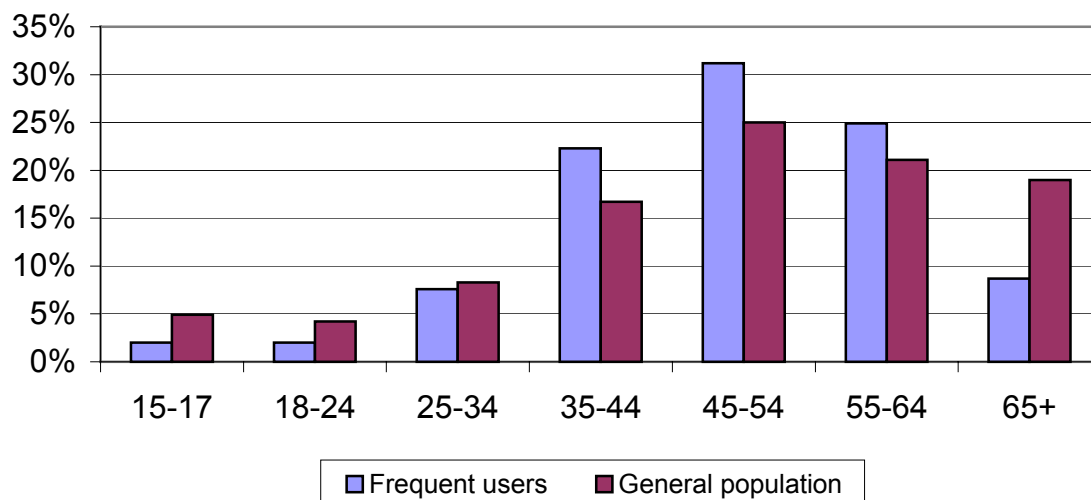
Frequent traveler information users tend to be employed commuters with access to advanced technologies, including roughly equal numbers of men and women

Based on the responses to the questions about awareness and use of traveler information sources, we identified a group of frequent users whose demographic and attitudinal profile could be studied in greater depth. For these purposes, “frequent users” were defined as respondents who reported using one or more traveler information sources – including radio, TV, websites, and other sources – five times per week or more. A total of 551 respondents (out of about 3100) met this criterion.

Compared to the general population, this group’s salient characteristics include its age, income, employment and commuting profile, attitudes regarding technology and commuting, and, to a somewhat lesser extent, its usage of advanced technologies.

Specifically, as Figure 4 shows, these frequent users are more likely to come from the middle age groups (35-54 years of age) rather than the younger and older groups. They are also more likely to be salaried, full-time employees and regular commuters, and to have higher household incomes. This is a pattern that is quite consistent with the demographic profile derived from the prior wave of the PSTP survey.¹⁰ On other demographic measures – notably gender balance, but also educational attainment and degree of working-hour flexibility – this group does not differ significantly from the population as a whole.

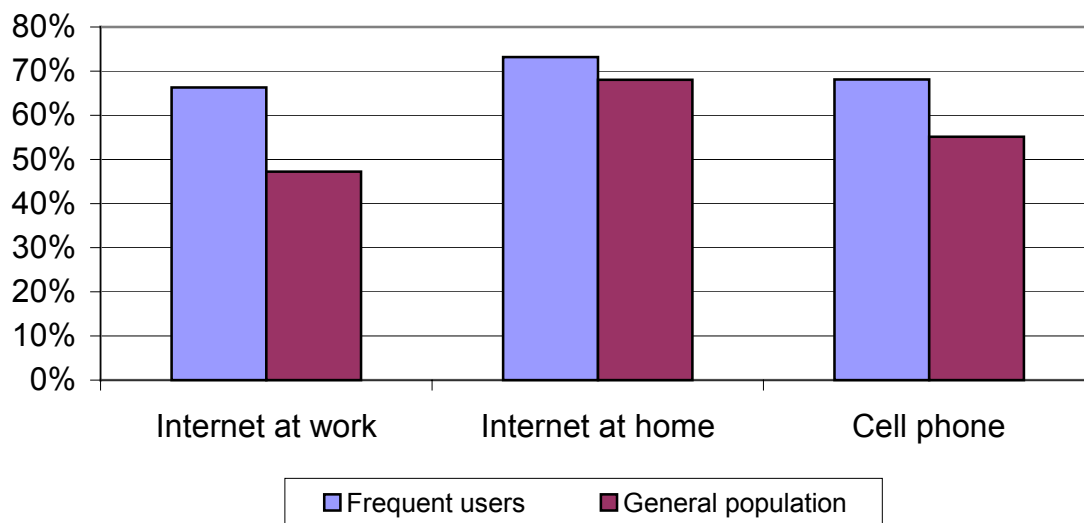
Figure 4. Age distribution of frequent traveler information users



¹⁰ Peirce and Lappin, op. cit. 2003.

Respondents who meet this “frequent user” definition also show slightly higher levels of usage of advanced technologies, particularly the internet and mobile telephones, as shown in Figure 5. The difference in *home* internet usage, while statistically significant, is fairly small, likely due to the enormous growth in home internet service over the past few years. A larger gap persists in workplace internet usage, which may be related to differences in job duties and the larger share of frequent users who are salaried and higher-paid employees.

Figure 5. Technology usage among frequent traveler information users
Percentage using each technology once per week or more



Frequent traveler information users are attitudinally more interested in planning ahead and staying in touch, and less satisfied with their commutes

Another series of questions measured respondents’ level of agreement to statements about personal attitudes (e.g., “I don’t like to have to plan ahead”) and commuting. These questions were included in the PSTP personal survey because previous research had shown them to be useful predictors of respondents’ level of interest in different types of ATIS services¹¹.

For each statement, the respondent’s level of agreement was measured on an eleven-point scale, where 0 represents total disagreement, 10 represents total agreement, and 5 is

¹¹ Mehndiratta, S. et al. 2000. Who are the likely users of ATIS? Evidence from the Seattle region. Transportation Research Board, 79th Annual Meeting, Washington, DC. and Peirce, S. and J. Lappin. 2003. Segmenting the Seattle-area market for ATIS. Report for Federal Highway Administration.

neutral. We compared the average (mean) agreement scores on these statements for this group of frequent users versus the overall sample and found some differences in a number of areas. In particular, frequent users stated that they were more inclined to plan ahead and more interested in staying reachable at all times. They also expressed less satisfaction with their commutes and a greater belief that traffic reports could help them save time. As Figure 6 shows, these differences were generally stable across the period from 2000 to 2003. (In each case, the difference between frequent users and the overall population is statistically significant.)

Figure 6. Mean agreement scores to attitudinal statements

0=completely disagree, 5=neutral, 10=completely agree

	2000		2003	
	Overall	Frequent users of traveler information	Overall	Frequent users of traveler information
I don't like to have to plan ahead.	3.6	3.2	3.5	3.1
It's important that other people be able to contact me pretty much all the time.	5.2	5.6	5.3	5.9
At least twice a week, there's an unexpected delay on my route	4.1	5.3	4.0	5.4
I am satisfied with my commute	6.1	5.0	6.3	5.2
Accurate, real-time traffic/transit information could reduce the amount of time I spend commuting	4.0	5.0	3.6	4.7

Since basic attributes of one's personality, such as attitudes toward punctuality, tend to be fairly stable over time, it is not surprising that overall agreement to the statements about planning ahead and staying in touch with others was almost identical in 2000 and 2003. The magnitude of the differences between frequent users and the general population on these attitudes also remained essentially stable, as they did on the commuting-related questions.

Frequent online ATIS users are also mostly employed commuters, but they constitute a much smaller, mostly male group with very high levels of technology usage

As previous sections showed, usage of online services still represents a small share of overall traveler information activity. Nonetheless, traffic and transit websites are among the most sophisticated of the available ATIS sources, with the most detailed and timely information. Current users of these services are thus likely to be the sorts of “early adopters” who seek out new technologies and services and who may place a relatively high value on traveler information.

“Frequent online ATIS users” were defined as those respondents who reported using any of the web-based ATIS sources five times per week or more. Only 43 respondents (less than 2 percent of the overall sample) met this criterion, so the profile that follows should be read with some caution. However, the profile is quite consistent with what has been found in user intercept surveys of traffic websites.¹² Also, the differences between this group and the general population, highlighted in the three paragraphs to follow, are all statistically significant despite the small size of the group.

Compared to the general population, the group of frequent online ATIS users includes a disproportionate number of working-age people, regular commuters, full-time salaried employees, and users of cellphones and the internet (see Figure 8 for a summary chart). Their household incomes are also well above average, with a majority earning over \$75,000 per year. In this sense, they closely mirror the overall profile of frequent traveler information (all sources) users, but with even starker differences from the general population.

Unlike the larger group of frequent information users, however, this group also contains a disproportionate number of men and college graduates. This might be an indication that these demographic groups have more inherent interest in the internet as a means of gathering information. Another possibility, though, is that this merely reflects the way ATIS websites are currently used – i.e., mostly from the workplace, and thus mostly by those with workplace internet connections, in the sorts of white-collar jobs where college-educated men may still tend to be found in disproportionate numbers¹³. Additional research could clarify this relationship, though the situation may also change as home-based broadband internet access become more ubiquitous.

On the attitudinal questions, these frequent online users again differ from the general population along many of the same dimensions as the larger group of frequent users. As Figure 7 shows, for example, the frequent online ATIS users express a greater

¹² Petrella, M. and Lappin, J., op. cit.

¹³ For example, the Wave 10 data show that 52% of men had workplace internet access, compared to 43% for women.

willingness to plan ahead and a greater degree of comfort with computers than the population as a whole. They are more likely to report encountering traffic delays, to express dissatisfaction with their commute, and to believe that accurate information could help them save travel time. As might be expected of people using advanced technologies, they also express more comfort with trying new products and services.

Figure 7. Mean agreement scores to attitudinal statements, 2003

0=completely disagree, 5=neutral, 10=completely agree

	Overall	Frequent online users
When I need information, I like to be able to ask someone rather than rely on a computer.	5.2	2.4
I don't like to have to plan ahead.	3.5	2.4
I don't like to take risks with new products and services.	4.6	3.8
At least twice a week, there's an unexpected delay on my route	4.0	5.8
I am satisfied with my commute	6.3	4.3
Accurate, real-time traffic/transit information could reduce the amount of time I spend commuting	3.6	5.3

Use of online ATIS tends to complement, not substitute for, broadcast reports

One area of ATIS research that has received some attention is whether advanced web-based services tend to “crowd out” the use of radio and TV reports. With respect to this question, it is worth noting that among this group of frequent online ATIS users, fully 63% also consult radio traffic reports 5 times per week or more, and 37% consult TV reports 5 times per week or more. Almost all of them report using radio or TV reports at least occasionally. This suggests that, at least for the majority of online ATIS users, these web-based reports have supplemented rather than supplanted the conventional broadcast reports. This group's stronger preference for radio (as opposed to TV) reports in particular would seem to reflect the fact that radio, as a source available in-vehicle and en route, is a strong complement to online services, which are generally accessed prior to departure.

Figure 8. Summary Chart: Profiles of frequent traveler information users and frequent online ATIS users

	Overall population	Frequent traveler information users	Frequent online ATIS users
Male	45%	46%	65%
Aged 35-54	42%	54%	58%
Employed full-time	45%	65%	86%
Hold college degree	46%	48%	63%
Household income over \$75,000	30%	36%	58%
Use the internet at work	47%	66%	95%
Use the internet at home	68%	73%	86%
Use broadband internet at home	25%	30%	52%
Carry a cellular phone	55%	68%	81%
Commute to work/school three days per week or more	61%	79%	95%
"I am satisfied with my commute" (mean agreement, 0-10 scale)	6.3	5.2	4.3
Use radio traffic reports 5 times per week or more	15%	83%	63%

Priorities for enhancement of ATIS services

Improvements to data quality rate most highly, though less frequent users also express interest in more content options

In the personal survey, respondents were presented with a list of seven possible improvements that could be made to ATIS traffic reports, and were asked to rank the top three that would be most important to them. The choices were:

- Traffic information covering *all* the roads on my usual and alternate routes, not just the busiest roads
- A traffic report that's tailored just to the roads I'm interested in taking
- Traffic information that is completely up-to-date
- Traffic information that I'm able to access quickly, for example by pressing one button
- Information on my travel alternatives, such as bus routes and schedules, not just traffic information
- Traffic forecasts that predict what traffic conditions will be like for the next hour

- Traffic information that gives estimated travel times between major destinations given current traffic conditions.

Overall, respondents gave clear priority to those enhancements that improve the basic quality of the ATIS information, particularly the timeliness of the information. A plurality of respondents, 36%, chose “traffic information that is completely up-to-date” as their top priority. As Figure 9 shows, respondents’ priorities for enhancement have remained quite stable over the past few years, with the same emphasis on improved timeliness, expanded coverage, and personalization – in that order. These findings are also consistent with those derived from surveys of regular users of traffic websites in the Los Angeles and Seattle areas, where suggestions for improving the timeliness and quality of the information were listed among the top concerns¹⁴.

Figure 9. Top priorities for potential enhancements to traffic ATIS services, 2000 and 2003

Percentage of all respondents listing the enhancement as their top priority

	2000	2003
Traffic information that is completely up-to-date	35%	36%
Traffic information covering <i>all</i> the roads on my usual and alternate routes, not just the busiest roads	16%	16%
A traffic report that’s tailored just to the roads I’m interested in taking	14%	13%

The pattern of priorities found here also confirms one of the findings¹⁵ from the prior wave of the PSTP survey, namely that the tendency to select an aspect of basic data quality – i.e. improved timeliness or expanded coverage – as one’s top priority for improvement rises with the frequency of ATIS usage. As the right-hand column of Figure 10 shows, the most frequent users choose improved data quality over new information options by over a 4-to-1 margin. This suggests that frequent users have, through their experience with ATIS, grown to expect improvements in roadway coverage and accuracy.

Non-users and less frequent users, by contrast, choose data quality over new information options by less than a 2-to-1 margin. In other words, though they still place top priority on improved data quality, they have *relatively* more interest in other content options, such as information on alternative modes of travel. This is not surprising, since one of the

¹⁴ Petrella, M. and Lappin, J., op. cit.

¹⁵ Peirce, S. and Lappin, J., op. cit. 2003.

reasons for their lower usage rates may be the very fact that the existing content options on traffic websites do not meet their needs as closely. As an example, an ATIS that provides only current travel speeds may be of little use to someone whose main interest is in forecast travel times for future dates.

Figure 10. Top priority for traffic ATIS enhancement, by rate of usage of traveler information

	Rate of traveler information usage		
	Less than once a week, or not at all	One to five times per week	Five times per week or more
More and better data (expanded road coverage or improved timeliness)	47%	56%	65%
New content options (information on travel alternatives, traffic forecasts, or estimated travel times)	27%	24%	15%
Improved ease of use (tailored reports or one-button access)	26%	20%	20%

Summary and Conclusions

The preceding sections analyzed several aspects of the Seattle-area market for traveler information in 2003, including some comparisons from previous years. This section summarizes the salient findings from that analysis and considers their policy implications.

First, though a change in question wording precludes exact comparisons, awareness levels of non-broadcast ATIS services appear to have risen between 2000 and 2003. The major ATIS websites are now known by about half the population, versus about one-quarter in 2000. Still, it is noteworthy that after years of deployment, there are large numbers of Seattle-area residents – including many who regularly use the internet – who have not even heard of the major ATIS sources. Even more striking is that awareness rates for specialized services are very low even among their target audiences. The Bus View and MyBus online transit updates, for example, are still largely unknown even among internet-surfing bus riders. All of this suggests that additional public outreach and marketing campaigns would help to maximize the return on the investment in these technologically sophisticated ATIS services.

Patterns of self-reported usage of traveler information services remain quite similar to

2000, with the broadcast reports on radio and TV making up the vast majority of information use. The most popular non-broadcast source, the Puget Sound traffic website, is regularly used by about 2 percent of the population – up from the 1 percent recorded in 2000, but still well shy of the roughly one-in-four who regularly use radio reports. One bright spot is that the major transit and ferry websites do get a fair number of occasional or intermittent users, meaning people who have used the sites in the past but do not necessarily consult them on a regular basis. This is an indication that, even though these users might not be taking advantage of the real-time updates offered by the sites, they are at least deriving benefits from them as resources for basic schedule and fare information, and for advance planning of unfamiliar transit and ferry trips.

Another noteworthy point about usage patterns is that frequent users of online ATIS services also report usage levels for radio traffic reports that are well above average. It would thus appear that this group continues to derive some incremental value from radio reports despite their frequent use of ATIS websites. This is almost certainly because radio reports, despite their limitations in terms of coverage and timeliness, are presently the only major source of in-vehicle, en route information. While this may soon change with the advent of more sophisticated in-car traffic and navigation systems, that would not negate the broader point, which is that the availability of sophisticated pre-trip websites does little to diminish the demand for in-vehicle information.

Two user profiles were generated from the 2003 data: frequent traveler information users and frequent *online* ATIS users. A combination of demographic and attitudinal variables were used in the profiles, allowing ATIS deployers both to locate information users within the population and to understand their motivations for seeking information. The profiles are highly consistent with earlier research and with each other, as both show that frequent information users are disproportionately drawn from the ranks of regular commuters, salaried employees, and those in the middle age ranges. Information users are also more likely to use advanced technologies such as mobile phones and the internet, and to encounter traffic delays and express dissatisfaction with their commutes. On attitudinal questions, they express less aversion to planning ahead and to trying new products and services than the population as a whole.

When looking specifically at the smaller group of frequent *online* ATIS users, these demographic and attitudinal differences from the general population are very similar in direction, but larger in magnitude. That is, online ATIS users are *even more* likely to be middle-aged salaried commuters, to use advanced technologies, to be dissatisfied with their commute, and to be open to planning ahead and using new services. The characteristics that set the online ATIS users apart from information users in general are that the former group contains proportionately more men and more college graduates. This likely reflects the fact that there continue to be large demographic differences in occupational make-up and workplace internet access, which interacts with the fact that so

much of ATIS website usage takes place at the office. Until these trends change, a web-only ATIS deployment strategy will not be the most effective way of reaching women and other groups whose workplace internet access levels continue to lag behind.

Enhancement priorities for traffic ATIS services have remained remarkably consistent from 2000 to 2003, with large pluralities of both regular users and the public as a whole placing a priority on improved timeliness of the information. This preference for improved timeliness only strengthens as experience with ATIS systems increases, meaning that ATIS deployers will have to continue to improve quality to meet the expectations of their users.

Non-users and less frequent users, while still placing a top priority on timeliness, also express relatively more interest in additional content options, such as traffic forecasts and information on alternative modes of transportation. The Puget Sound traffic website has recently added a forecasting feature to help users plan future trips, calculating expected travel times for selected roadway segments based on archived historical data. These kinds of innovations in the way information is presented may prove very helpful in attracting the many non-users who say that they are looking for information other than current travel speeds and incidents.

In sum, even as the Seattle-area market for ATIS has evolved and grown over the period from 2000 to 2003, most of its salient features – the profile of frequent users and the public's top priorities for ATIS enhancements – have shown a great degree of stability. Awareness and use of ATIS services have grown modestly, but have not fundamentally altered the structure of a market in which radio traffic reports continue to be the most common source of information. The range of policy prescriptions that flow from these facts also continue to hold true. In the broadest terms, these are to (1) employ the user profiles to conduct marketing and outreach initiatives to boost awareness among target audiences, and (2) continue to raise the quality of ATIS services, particularly with respect to the priority areas of timeliness and coverage, while also looking for opportunities to add the additional content options that would-be users describe as valuable.